The Southwest Alaska Network

Vital signs of the Southwest Alaska Network

Monitoring Framework	Vital Sign	Parks Where Monitored				
		ALAG	ANIA	KATM	KEFJ	LACL
Air and Climate	Visibility and Particulate Matter		○	●		○
	Weather and Climate			●	●	●
Geology and Soils	Glacier Extent			●	●	●
	Geomorphic Coastal Change		+	+	●	●
	Volcanic and Earthquake Activity	○	○	○	○	○
Water	Freshwater Chemistry	●	●	●	●	●
	Surface Water Hydrology	●	●	●	●	●
	Marine Water Chemistry			●	●	●
Biological Integrity	Invasive/Exotic Species	○	○	○	○	○
	Insect Outbreaks	○		○	○	○
	Kelp and Seagrasses			●	●	●
	Marine Intertidal Invertebrates			●	●	●
	Resident Lake Fish			●		●
	Salmon	○		○		○
	Black Oystercatcher			●	●	
	Marine Birds			●	●	●
	Bald Eagle	+	+	+	●	○
	Brown Bear	+	+	●		●
	Wolf	+		+		+
	Moose			●		●
	Sea Otter			●	●	
	Caribou			○		○
	Harbor Seal			○	○	○
	Vegetation Composition and Structure	●	●	●	●	●
	Sensitive Vegetation Communities			●	●	●
Human Use	Consumptive use	○	○	○		○
	Visitor Use	○	○	○	○	○
Landscapes	Land Cover	●	●	●	●	●
	Landscape Processes	●	●	●	●	●

● Vital signs for which the network will develop protocols and implement monitoring with funding from the vital signs or water quality monitoring program.

○ Vital signs that are currently being monitored long-term by a network park, another NPS program, or by another federal or state agency. The network will collaborate with these other monitoring efforts where appropriate but will not use vital signs or water quality monitoring program funds.

+ Vital signs for which monitoring will likely be done in the future but which cannot currently be implemented due to limited staff and funding.

NPS photograph

By Michael Shephard

The Southwest Alaska Network (SWAN) consists of five park units: Alagnak Wild River, Aniakchak National Monument and Preserve, Lake Clark National Park and Preserve, Katmai National Park and Preserve, and Kenai Fjords National Park. These units comprise 9.4 million acres or 11.6% of the total land area managed by the National Park Service. SWAN is approximately the size of Maryland and Delaware combined.

SWAN parks occur in one of the more geologically active regions in the world. During the great Alaska earthquake of 1964, lands in Kenai Fjords dropped 3 to 6 feet (1-2 m), whereas coastal lands of Lake Clark and Katmai rose by an equivalent amount. Volcanoes (17 active in SWAN units) steam or explode on a decadal scale, dispersing ash and generating mud flows in river valleys. Both Aniakchak and Katmai became park units due to their spectacular volcanic landscapes.

SWAN parks are aligned along the northern Gulf of Alaska, where the climate is dominated by maritime influences. Steep mountains and volcanoes create areas of high precipitation on the windward side of the mountains and rain shadows on the leeward side. These mountains are some of the snowiest places on the planet (3-15 ft/1-4.5 m of annual precipitation) resulting in approximately one-fifth of the landmass of this network being covered in ice or permanent snowfields.

Almost one-quarter of the marine coastline of the NPS (1,200 miles/1,930 km) occurs in this network. The coast ranges from the rocky, convoluted shoreline of Kenai Fjords to the more broad intertidal flats of Lake Clark. The salt marshes, rocky headlands, and intertidal areas provide key food resources to brown and black bears, bald eagles, shorebirds, and marine mammals.

Two of the three largest lakes in the NPS system occur within this network, Naknek Lake and Lake Clark, as well as many other multi-lake systems and thousands of miles of rivers and streams that are integral to nationally and internationally significant salmon runs. The salmon-based ecosystems are a flagship resource of the network.

SWAN has spent four years developing a monitoring program with biologists from each of the park units and other collaborators. The resulting monitoring objectives complement the natural resource work now being conducted in the parks. The network is currently focusing on 21 separate vital signs. Another seven vital signs are being monitored by other agencies. Annual reports, databases, resource briefs, and other summary materials are available on the internet to park staff and others interested in long-term monitoring efforts in the network. SWAN is collaborating with researchers at U.S. Geological Survey and the University of Georgia to use a structured decision making approach for linking monitoring data to management decisions, with sea otters being used as a test case.

Figure 1. Erik Beever (USGS) sampling the soft sediment intertidal for bivalves in Katmai National Park and Preserve in July 2009.